

**ABSTRACT**

A device for converting frequency of electromagnetic radiation includes a nonlinear medium that forms a moving grating in the nonlinear medium by introducing at opposite ends of the nonlinear medium a first set of electromagnetic radiation having varying frequencies.

- 5 Electromagnetic radiation is inputted into the nonlinear medium at a first frequency and extracted at a second frequency from the nonlinear medium. The moving grating in the nonlinear medium allows for electromagnetic radiation to be converted into the second frequency.